

Smoothing out the Wrinkles: On-sky Testing of the Apodized Phase Plate at 5 microns

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We present the first on-sky tests of an apodized phase plate (APP) designed to suppress diffraction up to and including parts of the first diffraction ring. Used in combination with the 6.5m MMT AO system and the unique low thermal background the deformable secondary mirror provides, the APP significantly reduces the speckle noise present in the PSF subtraction residuals. Theoretical cooling curves of extrasolar planets indicate a broad nonthermal feature at 4 to 5 microns that decays more slowly with time than the features at H and K band. We are extending our surveys to include older stars and to look for close-in planets using APPs for both L and M bands, and to additionally test for source incoherence using simple static wavefronts applied to the deformable mirror.